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CYMBULIOPSIS VITREA, A NEW SPECIES OF PTEROPOD.

BY HAROLD HEATH AND M. H. SPAULDING.

On the 27th of December, 1900, a large number of individuals of the species about to be described were taken at or near the surface of Monterey Bay, California, and twice since that time great shoals have been noted in the same locality. With the use of formalin, formalin-alcohol and picro-formalin their natural appearance and structure have been preserved with exquisite fidelity, and will be more fully discussed in a later paper.

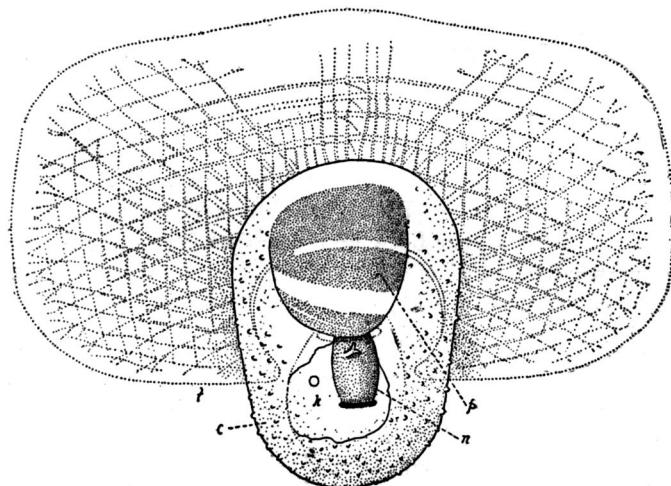
This species falls naturally into the genus *Cymbuliopsis* proposed by Pelseneer¹ which was made to embrace the two species *C. ovata* and *C. calcola*, but differs from these in several important respects. The "shell" or casque (Peck),² slightly asymmetrical, possesses the characteristic slipper form and bears on its external surface numerous small rounded tubercles which become smaller and more closely grouped together near the posterior-dorsal surface. Its aperture is large, unarmed and much wider than in *C. ovata*, but is almost identical with that of *C. calceola*, and as in the latter, its large cavity extends to the dorsal extremity. The maximum length of the casque is 4 cm., with a width of 2.5 cm.

The broad, perfectly symmetrical flattened proboscis constituting the head region is in contact with the upper surface of fin, yet free from it to a point immediately in front of the central nervous system. Its edges are grooved and lead into the wide funnel-shaped mouth and œsophagus. Dorsal to the latter and symmetrically placed are the tentacles having the form of small knob-like projections, each of which is supplied with a strong nerve from the cerebral ganglia. Peck noted the occasional absence of these

¹ Report on the Pteropoda collected by H. M. S. Challenger during the years 1873-1876, Part LXV, p. 96. Vide also *The Nautilus*, III, p. 30, 1889, where Dall shows *Cymbuliopsis* to be identical with his earlier genus *Corolla*.

² Peck, J. I., "On the Anatomy and Histology of *Cymbuliopsis calceola*," *Studies from the Biological Laboratory, Johns Hopkins University*, Vol. IV, No. 6.

structures in *C. calceola*, but it was found to be present in each of the fifty specimens of *C. vitrea* examined on this point. The œsophagus leads directly backward into the visceral mass, where it joins the relatively voluminous stomach provided with five large and several small teeth. The intestine makes one turn on the ventral surface of the stomach and opens into the mantle cavity slightly to the left of the median line. The remainder of the visceral mass is composed of the large liver and the gonad, which has the form of a thin sheet investing the surface of the visceral mass except at its forward extremity, where the albumen gland and seminal receptacle are situated.



Cymbuliopsis vitrea, ventral view, natural size. *C.*, casque or "shell;" *f.*, foot or fin; *k.*, kidney within mantle cavity represented by stippled line; *n.*, nucleus or visceral mass, showing termination of intestine and pigmented cap; *p.*, pallial gland.

The mantle cavity is placed on the ventral side of *Cymbuliopsis*, and anterior to the visceral mass a portion of the bounding epithelium is modified into the pallial gland. This is crossed by one complete and two incomplete transparent bands. Peck states that the pallial gland is "almost symmetrical in this genus, being twisted somewhat to the right, but the asymmetry was not marked."

In *C. vitrea* the asymmetry is not especially apparent, but it is twisted in the reverse direction to that described and figured by

Peck, and it also differs in being relatively larger and much nearer the anterior margin of the casque. Beyond the pallial gland the mantle cavity narrows and again enlarges to form the space surrounding the visceral mass, kidney and heart. Peck's figure of *C. calceola* represents the foot as extending to the anterior border of the casque, while in *C. vitrea* this organ is relatively much larger and projects beyond the shell almost half its width. Three sets of muscles operate it as in the other species of the genus, and a large number of pigment spots, probably sensory in function, are scattered along its margin.